PROJECT NO. 42631

RULEMAKING REGARDING SUBSYNCHRONOUS OSCILLATION IN THE ERCOT REGION	**§ § §**	**PUBLIC UTILITY COMMISSION OF TEXAS**

STAFF STRAWMAN RULE

The Public Utility Commission of Texas (commission) staff proposes a new rule to address subsynchronous oscillation (SSO) issues in the Electric Reliability Council of Texas (ERCOT) region. SSO is a potentially harmful phenomenon involving coincident oscillation between two or more transmission elements or generation resources at frequencies lower than the normal operating frequency (60 Hz) of the ERCOT System. Staff proposes a strawman rule that defines SSO, SSO Risk, and SSO Solutions, establishes a process for the study of SSO, proposes technical criteria, and assigns cost responsibility for solutions. To facilitate stakeholder discussion, staff presents a series of options related to transmission outages, paragraph (c)(8), protection and/or mitigation, subsection (f), and cost allocation, paragraph (g)(2). Additionally, bracketed placeholders within subsection (f) provide an opportunity for stakeholders to comment on specific items within this subsection.

The commission staff will conduct a workshop on the proposed rule in the Commissioners' Hearing Room, located on the 7th floor of the William B. Travis Building, 1701 North Congress Avenue, Austin, Texas 78711, at 9:30 am on Monday, July 28, 2014. Staff invites stakeholders to present comments at the workshop and file optional written comments in response to questions published in the workshop agenda. Parties submitting written comments should file 16 copies of such comments with the commission's Central Records office no later than 3:00 P.M. on Friday, July 25, 2014. All comments should reference Project No. 42631 and be limited to 10 pages.

Questions concerning this project should be referred to Julia Harvey, Wholesale Market Analyst, Competitive Markets Division, at julia.harvey@puc.texas.gov or (512) 936-7371.

CHAPTER 25. SUBSTANTIVE RULES APPLICABLE TO ELECTRIC SERVICE PROVIDERS.

Subchapter I. TRANSMISSION AND DISTRIBUTION.

DIVISION 1. OPEN-ACCESS COMPARABLE TRANSMISSION SERVICE FOR ELECTRICAL UTILITIES IN THE ELECTRIC RELIABILITY COUNCIL OF TEXAS.

§25.___. Subsynchronous Oscillation (SSO) in the Electric Reliability Council of Texas (ERCOT) Region.

(a) **Purpose**. The purpose of this section is to:

(1) enable ERCOT to protect the reliability of the electric grid by reducing the risk of SSO;

(2) clarify the responsibilities of ERCOT and other affected entities in evaluating the risk of SSO in ERCOT by conducting initial screenings and detailed studies;

(3) set forth the criteria for ERCOT's determination of the appropriate solution for individual instances of SSO risk; and

(4) assign the cost responsibility related to detailed SSO studies and modifications that may be necessary to reduce the risk or lessen the impact of SSO.

(b) **Application**. This section is applicable to ERCOT and all market entities listed in subsection (c).

(c) **Definitions**. The following terms, when used in this section, shall have the following meanings unless the context indicates otherwise:

(1) **Market entity --** Any person or entity participating in the ERCOT-administered wholesale market, including, but not limited to, a load serving entity, a power marketer, a transmission and distribution utility, a transmission service provider (TSP), a power generation company, a qualifying facility, an exempt wholesale generator, and electric cooperative, a municipally owned utility, ERCOT, and any entity conducting planning, scheduling, or operating activities on behalf of, or controlling the activities of, such market entities.

(2) **Market participant** -- A market entity other than ERCOT.

(3) **Mitigation** -- The installation and use of any equipment or the implementation of any procedure that may be used to mitigate or eliminate SSO Risk.

(A) Structural mitigation -- Installation and use of equipment that does not require operator action.

(B) Procedural mitigation -- Implementation of any procedure involving operator action that may be used to mitigate or eliminate SSO Risk.

(4) **Protection** -- The installation and use of automatic switching equipment that, in response to SSO, can remove the affected generation resource and/or transmission element from service.

(5) **Resource** -- A facility capable of providing electrical energy or load capable, in response to ERCOT operational instructions, of reducing or increasing the need for electrical energy or providing short-term reserves into the ERCOT system. This term includes generation resources and load resources.

(6) **Subsynchronous oscillation (SSO)** -- Coincident oscillation occurring between two or more transmission elements or generation resources at a natural harmonic frequency lower than the normal operating frequency of the ERCOT System (60 hertz), including, but not limited to, subsynchronous resonance, subsynchronous torsional interaction, induction generator effects, and subsynchronous control interaction.

(7) **SSO Risk** -- A probability greater than zero that an SSO event will occur under certain system conditions.

TRANSMISSION OUTAGE OPTIONS

OPTION 1

(8) **Transmission outage** -- The condition of a transmission facility or a portion of a facility that has been removed from its normal service, excluding the operations of transmission facilities associated with the start-up and shutdown of generation

resources. The removal of both circuits of a double-circuit transmission line constitutes two separate transmission outages.

OPTION 2

(8) **Transmission outage --** The condition of a transmission facility or a portion of a facility that has been removed from its normal service, excluding the operations of transmission facilities associated with the start-up and shutdown of generation resources. The removal of both circuits of a double-circuit transmission line constitutes one transmission outage.

(d) **Initial screening for SSO Risk**. ERCOT shall conduct initial screening studies to determine existing SSO Risk. ERCOT shall conduct subsequent screening studies as needed.

(e) **Detailed study of SSO Risk**. If ERCOT's screening studies indicate a significant SSO risk, ERCOT shall conduct a detailed SSO risk and protection and mitigation study. ERCOT may require the TSP that owns the transmission facilities that cause the SSO risk to conduct all or portions of the study, in which case the study or portions of the study shall be overseen and approved by ERCOT. The study shall include an estimate of the costs and benefits of applicable protection and/or mitigation measures and a timeline for implementation of the measures. ERCOT and any TSP conducting the study may obtain information necessary for the study from affected generators and TSPs.

PROTECTION AND/OR MITIGATION OPTIONS

OPTION 1

(f) **Determination of protection and/or mitigation.** ERCOT shall require the implementation of protection and/or mitigation measures as follows.

(1) For SSO risk associated with three or fewer concurrent transmission outages, ERCOT shall require the generators and/or TSPs at risk of SSO to implement the protection and/or structural mitigation measures that best take into consideration costs, benefits, risks, and other relevant factors to all market entities.

(2) For SSO risk associated with four, five, or six concurrent transmission outages, ERCOT shall, in coordination with affected market participants, implement the procedural mitigation that best takes into consideration costs, benefits, risks, and other relevant factors to all market entities.

OPTION 2

(f) **Determination of protection and/or mitigation.** ERCOT shall require the implementation of protection and/or mitigation measures as follows.

(1) **Existing generation resources**. If three or fewer concurrent transmission outages would put any existing generation resource at risk of SSO, ERCOT shall require the TSP that owns the transmission facilities that cause the SSO risk to implement protection and/or structural mitigation measures for its facilities that ERCOT determines best take into consideration costs, benefits, risks, and other relevant factors to all market entities. An existing generation resource is a generation resource that was considered by ERCOT to be in commercial operation before [to be specified date].

(2) **New generation resources**. If three or fewer concurrent transmission outages would put a new generation resource at risk of SSO, ERCOT shall require the owner of the new generation resource to implement protection and/or structural mitigation measures for the generation resource that ERCOT determines best take into consideration costs, benefits, risks, and other relevant factors to all market entities. A new generation resource is a generation resource that was considered by ERCOT to be in commercial operation on or after [to be specified date].

(3) **Existing and new generation resources.** For both existing and new facilities, if four, five, or six concurrent transmission outages would put any generation resource at risk of SSO, ERCOT shall, in coordination with affected market participants, implement the procedural mitigation that best takes into consideration costs, benefits, risks, and other relevant factors to all market entities.

OPTION 3

(f) **Determination of protection and/or mitigation.** ERCOT shall require the implementation of protection and/or mitigation measures as follows.

(1) For SSO risk associated with three or fewer concurrent transmission outages, ERCOT shall require the owner of the generation resource to implement protection and/or structural mitigation measures for the generation resource that ERCOT determines best take into consideration costs, benefits, risks, and other relevant factors to all market entities.

(2) For SSO risk associated with four, five, or six concurrent transmission outages, ERCOT shall, in coordination with affected market participants, implement the procedural mitigation that best takes into consideration costs, benefits, risks, and other relevant factors to all market entities.

COST ALLOCATION OPTIONS

(g) **Cost allocation**.

(1) **Costs related to SSO studies**. The TSP that owns the transmission facilities that cause the SSO risk shall pay the costs of conducting the study pursuant to subsection (e) of this section.

OPTION 1

(2) **Costs related to SSO Solutions**. The cost of implementing SSO protection and/or structural mitigation measures required by subsection (f) of this section shall be the responsibility of the entity on whose facilities the measures are implemented.

OPTION 2

(2) **Costs related to SSO Solutions.** The cost of implementing SSO protection and/or structural mitigation measures shall be the responsibility of the entity on whose facilities the measures are implemented. If protection and/or structural mitigation is implemented on a generation resource, ERCOT shall develop and implement a cost recovery process by which the generator will be reimbursed for these costs.

(h) **Implementation**. ERCOT shall develop additional requirements, protocols, and/or other standards to implement the purposes of this section as described in subsection (a).